Landsat Outreach to the National Park Service

presented by

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at the

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Premise & Actions

- Premise: The seven land management agencies of the federal government underutilize Landsat data for the operational management and monitoring of public land
  - The NPS, BLM, BIA, FWS, and Bureau of Reclamation of the DOI, the USFS of USDA, and the Army Corps of Engineers should be major customers of the Landsat program
- Actions:
  - Hired post-doc, Eric Brown de Colstoun, to conduct applied research on mapping & monitoring of public lands
  - Hired Anita Davis in 2004 as LDCM E&PO coordinator
  - Continuing support of outreach specialists Stephanie Stockman, Jeannie Allen, and Laura Rochhio
  - Focused portion of LPSO and LDCM E&PO on National Park Service (NPS)

Projects Linking Landsat to Parks

- Delaware River Basin (two parks)
- Sensing Cape Cod (one park as pilot)
- Chesapeake Bay Earth Science Ambassadors (over 100 sites)
- Earth as Parks (two parks initially)

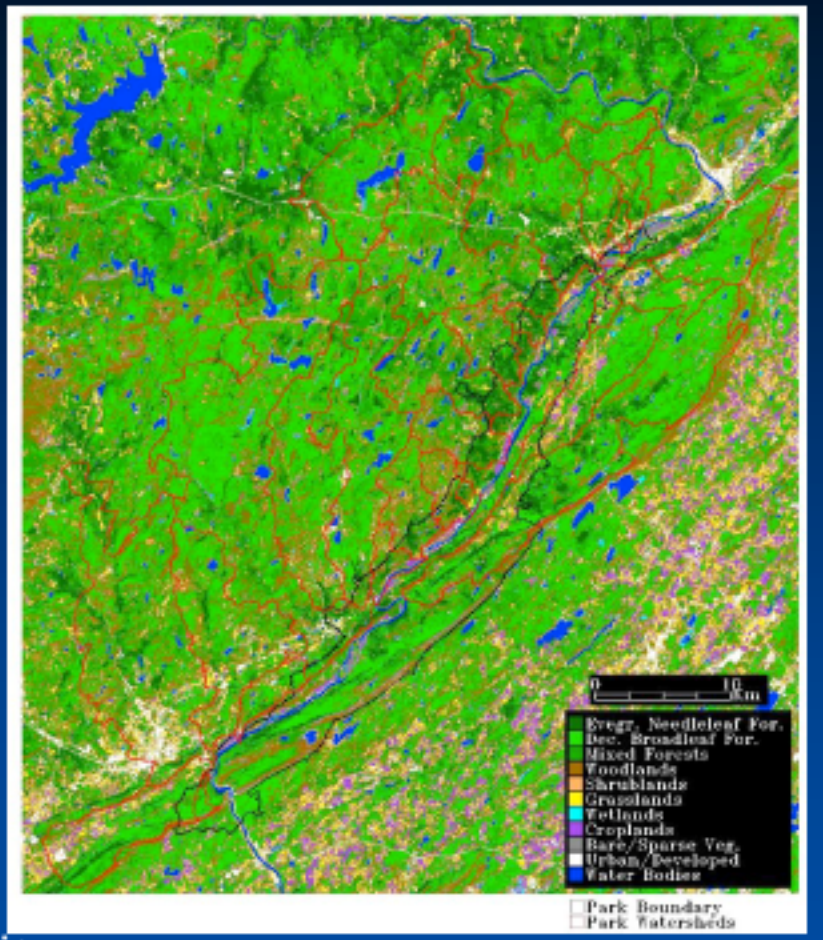
Delaware River Basin

- Efforts initiated by proposal to Carbon Cycle NRA in 2000
  - Title: Augmenting the NPS Vegetation Mapping Program Using Landsat 7 Data
    - Six-park pilot project
  - PI: Michael Story, NPS
  - Co-I's: Irons, Davis, & Brown de Colstoun
  - Proposal was not selected
- Persevered at one park, Delaware Water Gap National Recreation Area, with LPSO and LDCM E&PO support

National Park Vegetation Mapping and Monitoring

Phase 1:

- Vegetation mapping tools using multi-date Landsat 7 data demonstrated at Delaware Water Gap National Recreation Area (PA, NJ).
- Use National Vegetation Classification Standard, and NPS mapping and accuracy assessment protocols.
- Use state-of-the-art decision tree classifier.
- Brown de Colstoun , E.C., M.H. Story, C. Thompson, K. Commisso, T.G. Smith, and J.R. Irons (2003). National Park Vegetation Mapping Using Multi-temporal Landsat 7 Data and a Decision Tree Classifier, *Remote Sens. Environ.*, 85:316-327, 2003.



Phase 2:

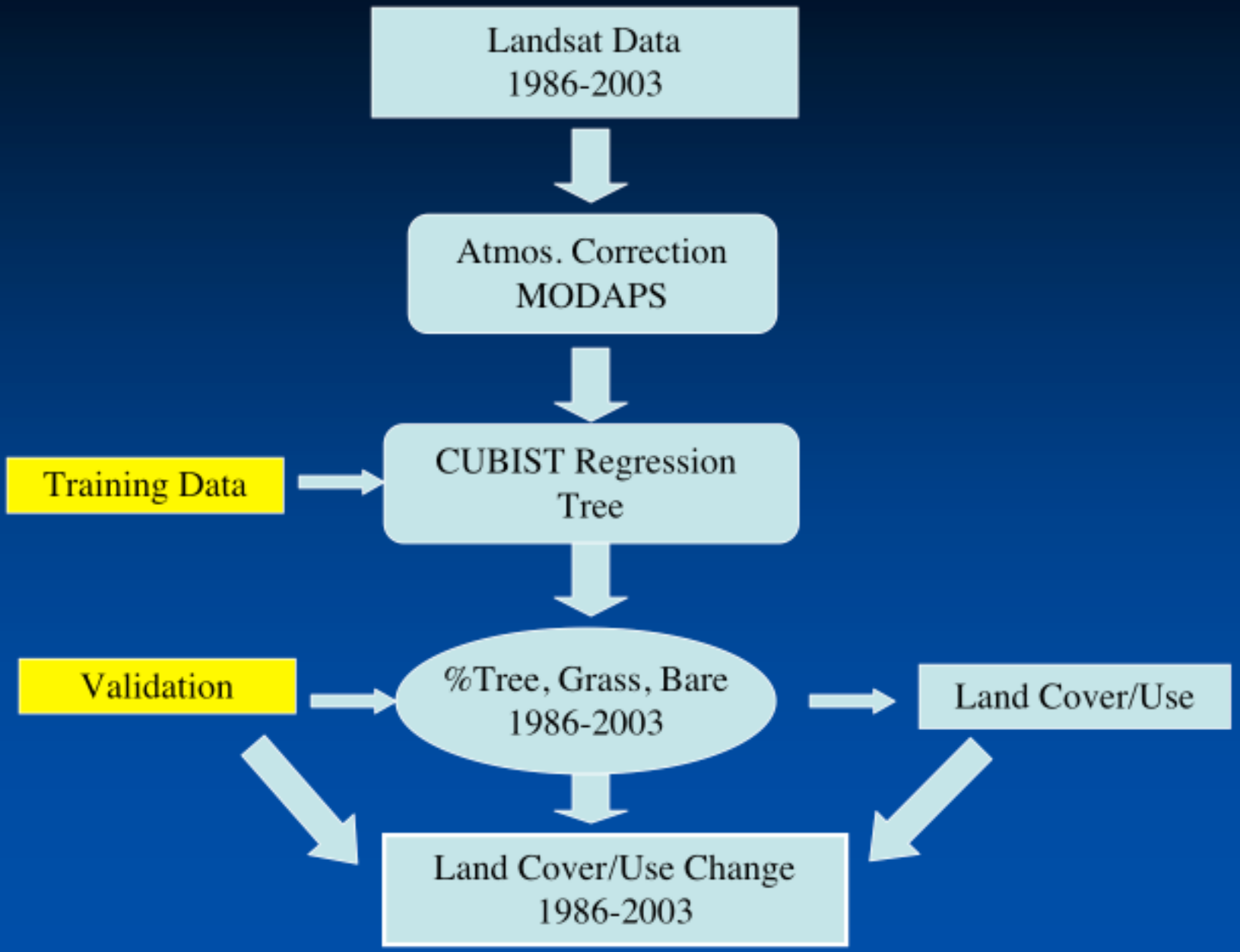
- Use Landsat for active monitoring of natural resources at Delaware Water Gap NRA and vicinity:
  - -Invasive Species (Woolly Adelgid).
  - -Urban growth pressures on the park.
  - -Input to urban growth and watershed models.

Consequences of Land Cover/Use Changes on National Parks: A Research/Educational Partnership in the Upper Delaware River Basin

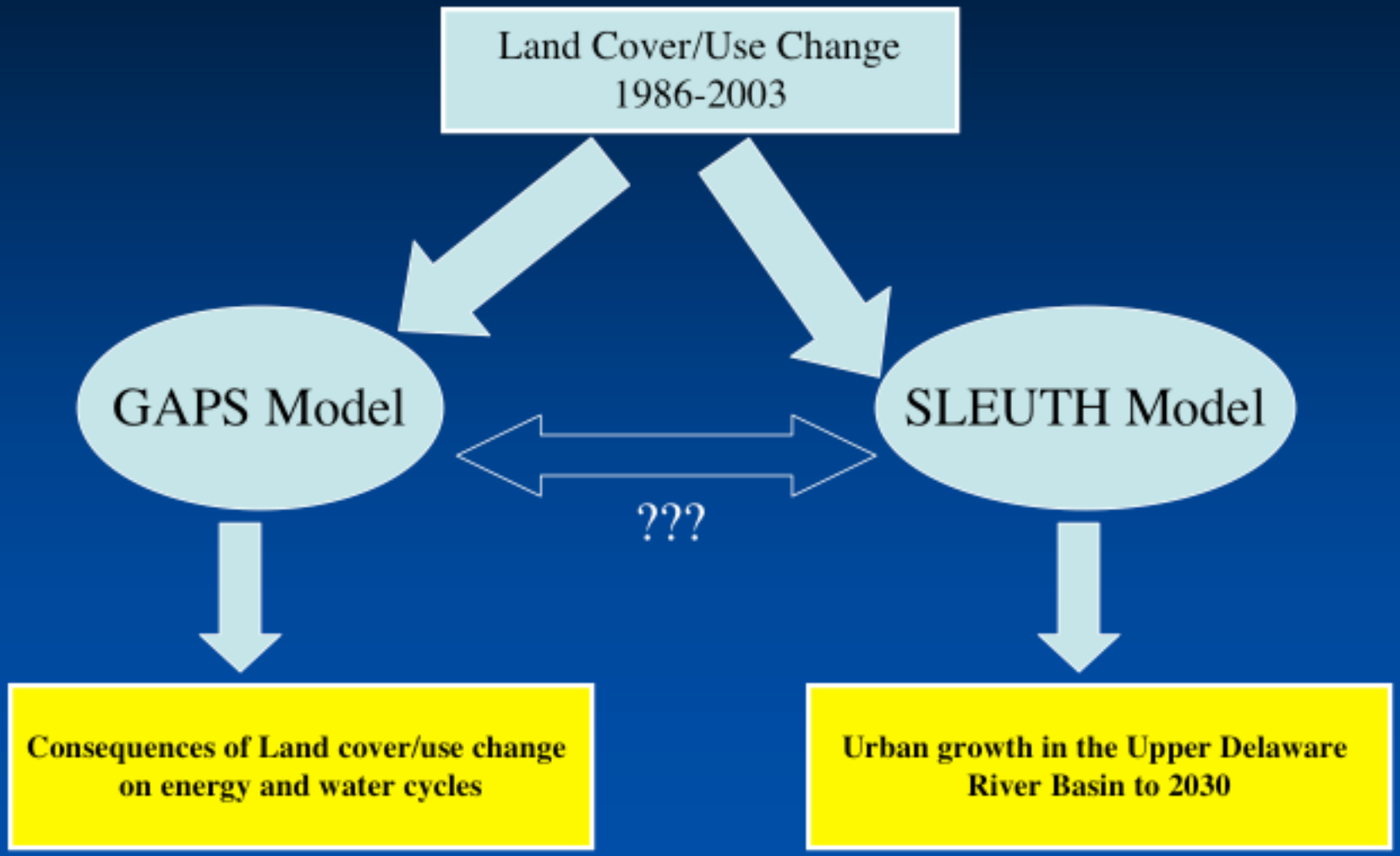
- Proposal submitted to NASA's New Investigator Program
  - P.I.: Eric Brown de Colstoun, Education Coordinator: Anita Davis;
  - Co-I's: Craig Thompson (NPS, DEWA) , Dave Forney (NPS, Upper Delaware SSR), Scott Goetz and Claire Jantz (Woods Hole)
  - Partners: Elissa Levine (NASA/GSFC), Susan Riha (Cornell U.), River Valley GIS consortium (UPDE, DEWA), GLOBE program, area schools

- Research Objectives
  - To develop cost-effective, satellite-based methods to inventory and monitor land cover/use in and around National Parks in support of the NPS Inventory and Monitoring Program.
  - Measure land cover/use changes and trends in the Upper Delaware River Basin from 1986 to the present using Landsat.
  - Simulate urban growth to 2030 with various growth scenarios using SLEUTH urban growth model.
  - Examine consequences of land cover/use changes on regional water and energy cycles with the GAPS model.

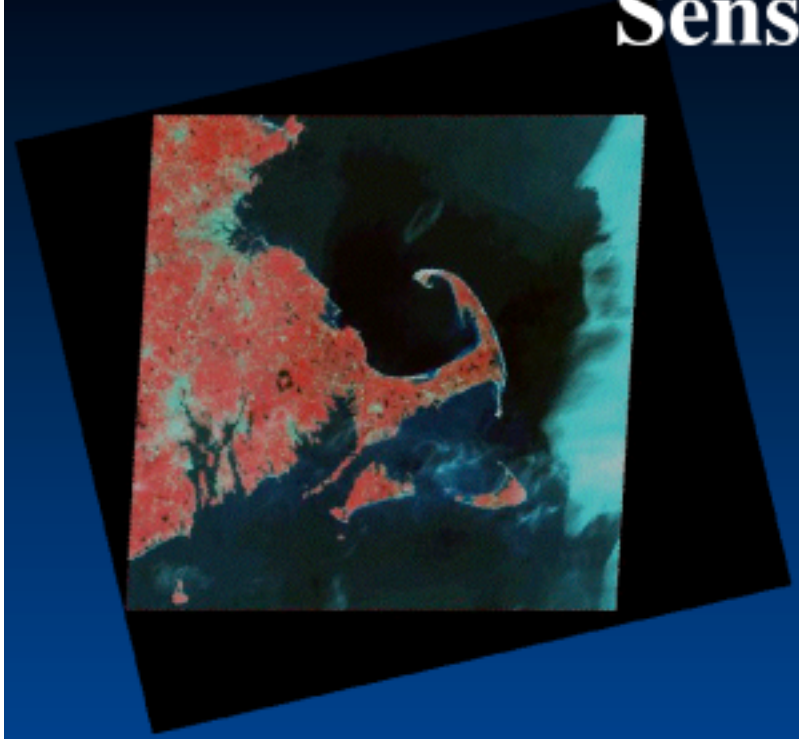
Research Overview



Research Overview



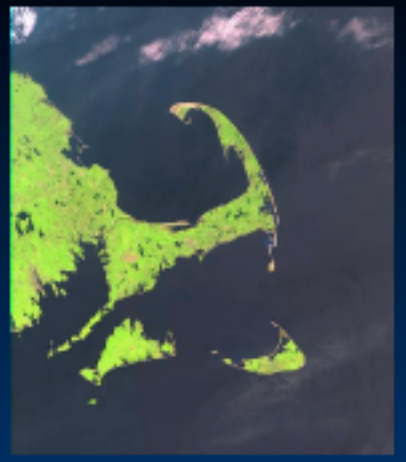
Sensing Cape Cod



Objectives

- Increase understanding and use of Landsat and other NASA capabilities among NPS staff and associated educators
- Enable scientists, educators, and students to examine Park resource issues using Earth system science approach, with aid of satellite remote sensing and ground level measurements
- Teachers and students learn and use remote sensing by working with scientists
- Project is expanded to other parks

Sensing Cape Cod



Accomplishments

- Core education/scientist team formed, trained in remote sensing and Earth system Science
- Field component of curriculum developed
- Over 9000 students will be reached in year one of curriculum use (this year)

Next Steps

- Finalize curriculum
- MA Marine Ed Assoc. evaluation
- Curriculum becomes part of Park program
- Dissemination to other parks

Earth System Science Ambassadors for the Chesapeake Bay

Objectives:

Enable and encourage educators/interpreters to use Landsat content and imagery in informal education efforts around the Bay

Create and provide Landsat content, imagery and educational materials from existing resources for use by "Earth Ambassadors" to reach millions of Bay visitors annually

Accomplishments

- Initial meetings with representatives of Bay Program Office (EPA, NPS)
- Training session on remote sensing with key members of project
- Identified target audiences, defined themes and subthemes
- Initial research on Bay issues and existing Landsat materials

Next steps:

- Create ESS/RS core packet &/or training for ambassadors
- Develop interpretive background packet for each theme
- Submit final product to ESE Education Review
- Post final packets on web

Earth as Parks

- In beginning phase
- Outgrowth of Earth as Art
- Library of Congress
- USGS
- Acadia and Shenandoah are pilot parks
- Images tied to historical maps, documents, and park themes; posted on popular website; made available for park interpreters, educators, etc.

American Memory
Historical Collections for the National Digital Library

Earth as Parks

Accomplishments

- Initial meetings well received
- Divisions of Interpretation and Resources Management engaged
- Research and development underway
- Evaluation plan under development (through collaboration with AGI)

Concluding Remark

- We are working to ensure that the LPSO and LDCM outreach to the National Park Service is in sync with the ESE Education, Application, Terrestrial Ecology, and Land Cover / Land Use Change Programs